National Institute of Environmental Health Sciences

Suspended sediment, nitrogen and phosphorus concentrations and exports during storm-events to the Tuross Estuary, Australia

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Abstract:

This paper presents a process for estimating pollutant loads from water quality data, to improve catchment-scale modelling in the region for resource management purposes. It describes a program to estimate suspended sediment, total and dissolved nitrogen and phosphorus loads to the Tuross estuary from the Tuross River catchment (1810 km(2)) of coastal southeast Australia. Event-based water quality sampling results obtained during storm events in 2005 are presented. Event 1, during July 2005 was the largest storm event in terms of peak flow for 3.5 years. Other events monitored were also in July, November and December 2005. The early July 2005 event had a flow-weighted mean suspended sediment (SS) concentration during the first 4 days of 63 mg L(-1). Of the events monitored, this was unusual as it was preceded by drought and had the largest SS concentrations (peaking at 180 mg L(-1)) during the rising-stage. In contrast, the November event had a much lower flow-weighted SS mean (28 mg L(-1)), even though peak flow magnitudes were similar. The July and November 2005 events had peak flows of 12,360 and 11,330 ML day(-1). Low-cost rising-stage siphon samplers were used to collect samples during the rapidly rising phase of these events. The use of such samplers and consideration of time-lead/lag flow adjustments, quantified using cross-correlation analysis to account for hysteresis effects, were incorporated into the load estimation techniques. The technique is a potentially useful approach for understanding relationships between water quality concentrations and flow for modelling catchment source strengths and transport processes.

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Resource Description

Communication:

resource focus on research or methods on how to communicate or frame issues on climate change; surveys of attitudes, knowledge, beliefs about climate change

A focus of content

Communication Audience:

audience to whom the resource is directed

Policymaker

Exposure :

weather or climate related pathway by which climate change affects health

Extreme Weather Event, Food/Water Quality, Precipitation

Extreme Weather Event: Drought

Food/Water Quality: Chemical

Geographic Feature:

resource focuses on specific type of geography

Freshwater, Ocean/Coastal, Other Geographical Feature

Other Geographical Feature : Estuary

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Australasia

Health Impact:

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

Mitigation/Adaptation:

mitigation or adaptation strategy is a focus of resource

Adaptation

Model/Methodology:

type of model used or methodology development is a focus of resource

Exposure Change Prediction

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment:

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content